Medentech, Ltd. – Aquatabs™

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Device Information

Aquatabs contain sodium dichloroisocyanurate, a form of chlorine. Fifty chlorine tablets are individually packaged in foil pouches in sheets of 10 tablets. Directions for use require the addition of 1 tablet to 1 liter of water and wait 30 minutes before consuming. If sediment is in the water, the user is directed to allow the water to settle or filter the water through a fine cloth. The decanted or filtered water should then be treated with Aquatabs. One chlorine tablet added to 1 liter results in a 5 mg/L chlorine concentration. Sodium dichloroisocyanurate is a stabilized form of chlorine that slows the degradation of chlorine in the presence of sunlight.

Effectiveness Against Microbial Pathogens

No test data is available for the Aquatabs using the U.S. Environmental Protection Agency (USEPA) Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1). There is a significant amount of research on chlorine disinfection and is summarized in reference 2. Without testing data specific to this device, it must be evaluated using available general research on chlorine disinfection. In the absence of testing data specific to this device and based on available research, the Aquatabs should be capable of consistently reducing bacteria and viruses to the required minimum log reductions stated in reference 1 (i.e., 6-log bacteria and 4-log virus reduction). When used as directed, the dose and wait time correspond to a disinfectant concentration times contact time (CT) of approximately 150 mg-min/L. When used as directed, the resulting CTs should be more than adequate to consistently provide a 6-log bacteria and 4-log virus reduction. When used as directed, this device will not consistently provide a 3-log reduction of *Giardia* cysts and *Cryptosporidium* oocysts. Based on the USEPA's Surface Water Treatment Rule CT tables for *Giardia* cyst inactivation, CT levels up to 382 mg-min/L at colder temperatures (0.5° C) and higher pH levels (8.0) are recommended for a 3-log *Giardia* cyst reduction using chlorine. When used as directed, Aquatabs would not consistently provide a 3-log reduction at colder temperatures and higher pH levels. Increasing the wait time beyond the directed 30 minutes to approximately 1.5 hours results in a CT of 450 mg-min/L and would likely ensure a 3-log *Giardia* cyst reduction at colder temperatures and higher pH levels. Numerous studies have shown that chlorine is not effective against *Cryptosporidium* oocysts for typical drinking water applications

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(reference 2). Tremendous doses and wait times are necessary for adequate *Cryptosporidium* oocyst reduction, making Aquatabs an unrealistic choice. Based on general chlorine disinfection studies, the Aquatabs are given one √ each for bacteria and viruses, and an X for *Giardia* cysts and *Cryptosporidium* oocysts (for an explanation of the rating checks click here). The following table summarizes Aquatabs expected performance, evaluation rating, and the mechanism by which pathogens are reduced:

Table. Expected Performance Against Microbial Pathogens When Used As Directed.

Microbial Pathogen Type	Expected Performance	Evaluation Rating	Reduction Mechanism
Bacteria	6-log	√	disinfection
Viruses	4-log	√	disinfection
Giardia cysts	Not Effective*	X*	-
Cryptosporidium oocysts	Not Effective	X	-

*Recommend at least 90 minutes contact time to ensure 3-log *Giardia* cyst reduction.

Production Capacity

One package of Medentech Aquatabs treats 50 liters.

Cleaning, Replacement, End of Life Indicator, Shelf Life

The shelf life of Aquatabs is 5 years from the date of manufacture.

Weight and Size

The weight of the Aquatabs package is approximately 10 grams. The approximate dimensions of a sheet of 10 tablets are 10 cm x 4 cm. Five sheets are approximately 1 cm deep.

Cost

Aquatabs are not sold at stores in the United States. The device is available through online ordering and at stores outside of the United States. The device costs approximately $10.00.

Device Evaluation

No data testing the Aquatabs was available. General research conducted on chlorine disinfection indicates that this device should be capable of consistently reducing bacteria and viruses when used as directed. This device is not capable of consistently reducing *Giardia* cysts and *Cryptosporidium* oocysts when used as directed. Extending the wait time from 30 minutes to at least 1.5 hours will likely ensure adequate reduction of *Giardia* cysts in colder waters and higher pH levels. Aquatabs are not effective against *Cryptosporidium* oocysts. Additional treatment, such as a 1 µm absolute filter, is necessary to adequately reduce *Cryptosporidium* oocysts. When used as directed, Aquatabs will expose the user to chlorine and cyanuric acid and may expose the user to disinfection byproducts such as trihalomethanes and haloacetic acids when chlorine reacts with naturally present organic matter. However, when used as directed for short periods of time, exposure to these compounds is not expected to cause adverse health effects in healthy adults (reference 2).

Advantages

- Expect consistent protection from bacteria and viruses when used as directed.
- Very small and lightweight.
- Simple and inexpensive to use.
- No adverse health effects expected in healthy adults.

Disadvantages

- Not consistently effective against *Giardia* cysts when used as directed. Recommend at least 1.5 hours wait time for adequate *Giardia* cyst reduction.
- Not effective against *Cryptosporidium*. Additional treatment is necessary.
- Does not reduce or remove particulate matter.
- Can impart taste and odor.

References

1. USEPA, Registration Division Office of Pesticide Program, Criteria and Standards Division Office of Drinking Water. (1987). *Guide Standard and Protocol for Testing Microbiological Water Purifiers.* Washington, D.C.

2. U.S. Army Center for Health Promotion and Preventive Medicine. (2005). *Technical Information Paper; Chlorine Disinfection in the Use of Individual Water Purification Devices,* Aberdeen Proving Ground, MD.